



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/SE90/00636</p> <p>(22) International Filing Date: 3 October 1990 (03.10.90)</p> <p>(30) Priority data: 8903240-3 3 October 1989 (03.10.89) SE</p> <p>(71)(72) Applicant and Inventor: OHLSON, Kjell [SE/SE]; Dragbrunnsgatan 7, S-753 32 Uppsala (SE).</p> <p>(74) Agent: KUMMELSTEN, Per, Arne; Uppsala Patentbyrå, Box 9013, S-750 09 Uppsala (SE).</p> <p>(81) Designated States: AT (European patent), AU, BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FI, FR (European patent), GB (European patent), HU, IT (European patent), JP, LU (European patent), NL (European patent), NO, SE (European patent), SU, US.</p>		<p><b>Published</b> <i>With international search report. In English translation (filed in Swedish).</i></p>
<p>(54) Title: LASHING EYE</p> <div data-bbox="548 1134 1299 1568" data-label="Image"> </div> <p>(57) Abstract</p> <p>A lashing eye for lashing or tying down goods on freight vehicles includes a keeper cup (1) with a lashing or fastening ring (2) pivotably mounted therein and a bolt fixing (4), the bolt of which passes through the cup (1). The ring (2) and cup (1) are made as separate parts. The ring (2) is removably mounted in a recess (1i) made in the cup (1), said recess being open, at least on one side, and situated at one side of the bolt of the bolt fixing (4). The ring (2) is kept in place in its recess (1i) by the bolt fixing (4). The cup (1) and ring (2) preferably are two separate parts made as castings.</p>		

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LASHING EYE

## TECHNICAL FIELD

The present invention relates to devices for tying down or lashing goods carried by goods vehicles. More specifically, the invention relates to so-called lashing eyes, i.e. devices mounted on a load deck or the like for serving as fastenings for strapping or tensioning bands, or for hooks, when tying down the load.

## BACKGROUND OF THE INVENTION

With freight transport, it is essential that the goods are kept firmly in place, and that they do not come loose during transport. Strapping and the like are used to this end, and there must be suitable means on the load deck for securing the strapping. In Sweden, for example, there is the requirement that goods vehicles shall be provided with approved anchoring means at the floor and/or walls of the goods space. For this purpose there are used, inter alia, so called lashing eyes, which are fixed in the loading deck, so that they are flush with its upper surface when not in use. A ring-shaped part of the lashing eye can be lifted up out of the plane of the deck for lashing the goods.

Several different types of lashing eye are known, all of which have certain disadvantages, primarily with regard to fixing the device sufficiently firmly in the deck and/or easy and reliable attachment of the strapping, fastening hook or the like, to the lashing eye. The known lashing eyes are often relatively complicated to fabricate and fit, and it is difficult - if even possible - to replace a damaged lashing ring. Another disadvantage with known lashing eyes is that they only permit the use of relatively small lashing rings, resulting in that there is often only the opportunity of using a hook, since too much wear would occur on strapping or the like when repeatedly pulled through the ring.

### OBJECT OF THE INVENTION

The invention has the object of achieving a lashing eye of the kind mentioned, that better than presently available lashing eyes meets the demands of simplicity, as well as  
5 safety in manufacture, fitting and use.

A special object of the invention is to provide a lashing eye of the kind mentioned, which comprises few parts only, and which is suitable for casting, e.g. in aluminium, a usual material nowadays for load decks and the like.

10 Another special object of the invention is to provide a lashing eye of the kind mentioned, where the lashing ring is excentrically mounted in its keeper cup, preferably close to the periphery of the latter, thus enabling a lashing ring with a larger diameter in the region where it comes into  
15 contact with strappings or hooks when in use.

A further object of the invention is to provide a lashing eye of the kind in question, where the lashing ring itself may be easily replaced.

20 A still further object of the invention is to provide a lashing eye which can be fixed in a loading deck floor using both a bolted connection and welding.

### SUMMARY OF INVENTION

The objects given above, as well as other objects and advantages are achieved in accordance with the invention by  
25 the lashing eye having been given the characterising features disclosed in the accompanying claims and which are explained in more detail in the following.

### SHORT DESCRIPTION OF THE DRAWINGS

A presently preferred embodiment of the inventive lashing eye is illustrated on the drawings, where;  
30

Figure 1 is a view from above of the inventive lashing eye, with its ring in a retracted, inoperative position.

Figure 2 is a perspective view of the lashing eye in Figure 1, with the lashing ring in its opened-up, operative  
35 position.

Figure 3 is a section along the line A - A in Figure 1, the lashing ring being shown in both its operative and in-operative positions.

Figure 4 is a perspective view of the lashing ring of the lashing eye.

Figure 5 is a perspective view, obliquely from above, of the lashing eye keeper cup.

Figure 6 is a perspective view, obliquely from below, of the keeper cup.

Figure 7 is a view from below of the keeper cup, with the lashing ring in its retracted position.

Figure 8 is a section corresponding to the one in Figure 3, but where a bolt fixing included in the lashing eye has been drawn in, and

Figure 9 is a section corresponding to that of Figure 8, but showing an alternative embodiment.

#### DESCRIPTION OF PREFERRED EMBODIMENTS

The inventive lashing eye illustrated on the drawings essentially comprises only a keeper cup 1, a lashing or anchoring ring 2 and a bolt fixing 4. The cup 1 and ring 2 are made as separate members, e.g. from aluminium or other suitable material. Due to the special form of the cup 1 and the ring 2, it will be possible to make them by casting, which simplifies manufacture considerably. (It should be noted that different details need to be welded together in the manufacture of known lashing eyes). The keeper cup 1 is intended to be fixed directly to a load deck 3 or the like (see figures 3 and 8) with the upper edge of the cup 1 substantially flush with the load deck 3. The ring 2 is kept in the cup 1 with the aid of the bolt fixing 4, which can also be utilised for retaining the lashing eye in the load deck by coaction with some suitable load carrying member thereof. As an alternative or supplement to the bolt fixing 4 the lashing eye can also be welded to a suitable load carrying member of the load deck. This weld 3a is illustrated in figures 3 and 8, and as shown it also provides a necessary seal between the cup 1 and the load deck.

The keeper cup 1 is circular in the illustrated embodiment, but also other shapes are possible within the scope of the invention. The cup 1 essentially consists of a side wall 1a and a bottom 1b. The bottom 1b has upwardly projecting first and second lugs with respective contact surfaces 1c and 1d for the head of the bolt in the fixing 4, preferably via a suitable washer 4a. There is a through recess or opening in the bottom 1b of the keeper cup 1 between the lugs for the bolt 4. For proper guidance of the bolt there is a guide groove 1e in at least one of the lugs.

In accordance with the invention the opening 1f also serves as part of the through opening required for fitting and removing the ring 2 to and from the keeper cup 1. For this purpose the opening 1f merges with lateral openings 1g and 1h, such as to form a substantially U-shaped opening in the bottom 1b of the cup 1. As will best be seen in figures 3 and 6, the peripherally situated lug forming the engagement surface 1d is provided with a recess 1i at its bottom, the recess thus forming a downwardly open channel extending between the end portions of the openings 1g and 1h. A portion 1k of the lug forms a partition wall, separating the opening 1i from the opening 1f.

As will best be seen in Figure 4, in the illustrated embodiment, the lashing ring 2 includes a straight end portion 2a, a substantially semi-circular end portion 2b with intermediate portions 2c, 2d joining said portions 2a and 2b. When the ring 2 is fitted to the cup 1, the portion 2a is taken down through the recess 1f past the wall 1k, subsequent to which it is swung forwards such as to snap into the recess 1i with the portion 2b resting on the supporting lugs 1l, 1m in the cup 1. Fitting is completed with the aid of the bolt fixing 4, see Figure 8 in particular. The bolt fixing 4 may optionally be provided with a washer 4b, for retaining the portion 2a of the ring 2 in the keeper cup 1, as schematically illustrated in Figure 8.

Figure 8 also illustrates an alternative embodiment, where the partition wall 1k has been excluded, the bolt of the fixing 4 fulfilling the function of this wall instead.

The recess 1i accommodating portion 2a is open towards the opening 1f, thus enabling this portion 2a to be inserted in the recess 1i from one side. Particularly in applications where the load on the lashing eye is not too great, the  
5 recess 1i can be formed as an upwardly open groove, so that the portion 2a of the ring 2 can be placed in the recess from above. In this embodiment, the washer 4a, or a heavier washer 4c or other like means included in the bolt fixing 4, can be implemented such that it closes off the opening of the recess  
10 when the bolt is tightened, and is sufficiently robust to keep the ring 2 in the recess when in use.

Figure 9 illustrates an embodiment having a recess for the ring portion 2a that is open upwardly and towards the bolt, a heavier washer 4c also being used in the bolt fixing  
15 4. In both the latter embodiments (the recess 1i open on one side and/or from above) it is not necessary to take the portion 2a of the ring 2 through the bottom 1b of the cup 1 for fitting into the respective recess. The cup 1 may then be cast without any openings, or possibly only with a through  
20 opening 1f for the bolt.

By pivoting the ring 2 around its end portion 2a, it can readily be moved between its retracted, inoperative position (figures 1, 3, 8) and the opened-out transport position (figures 2, 3). It should be noted that the lashing ring 2  
25 does not have any parts projecting out from the plane of the load deck 3 (which is obviously unsuitable) and also that the upper surface of the lashing portion 2b is flat and flush with the load deck. It also fills up most of the open area of the cup 1, thus obviating any problems with truck wheels and  
30 the like.

The invention is of course not intended to be restricted to specifically described embodiments that have been illustrated on the drawings, and many modifications and variations are possible within the scope of the accompanying claims.

## CLAIMS

1. Lashing eye including a keeper cup (1) with a lashing or fastening ring (2) pivotably mounted in the cup (1), and a bolt fixing (4) passing through the cup (1), characterised in that the ring (2) and cup (1) are made as two separate parts; in that the ring (2) is removably mounted in a recess (1i) made in the cup (1), said recess being open, at least on one side, and situated at the side of the bolt fixing (4) and in that the ring is kept in place in its recess (1i) with the aid of the bolt fixing (4).
2. Lashing eye as claimed in claim 1, characterised in that the keeper cup (1) and the lashing ring (2) are two separate parts made as castings.
3. Lashing eye as claimed in claim 1 or 2, characterised in that the bolt fixing (4) also serves as fixing means for fixing the cup (1) to the load deck (3) of a freight vehicle.
4. Lashing eye as claimed in any one of the preceding claims, characterised in that the recess (1i) is downwardly open at the underside of the bottom (1b) of the cup (1).
5. Lashing eye as claimed in any one of the preceding claims, characterised in that the ring (2) forms an undivided, closed ring.
6. Lashing eye as claimed in any one of the preceding claims, characterised in that the ring (2) comprises a substantially straight portion (2a), adapted for accommodation in said recess (1i) in the cup (1), and a rounded-off lashing or fastening portion (2b), adapted to assume an inoperative position when the device is not in use, such that its upper surface is substantially flush with the upper edge of the cup (1), and such that its outward side surface substantially conforms to the side wall (1a) of the cup (1).



7. Lashing eye as claimed in claim 6, characterised in that the lashing or fastening portion (2b) of the ring (2) has a substantially flat upper surface.

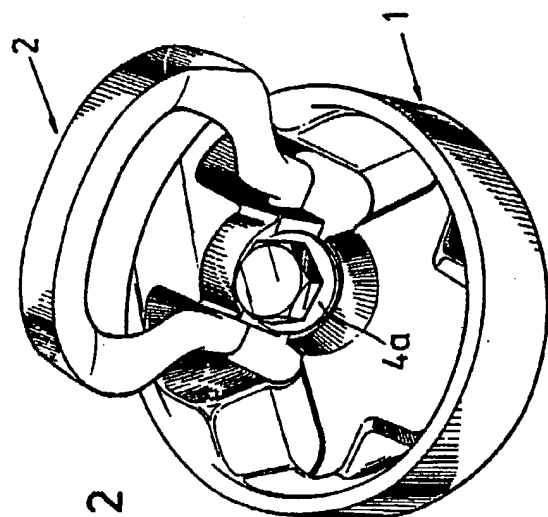


Fig. 2

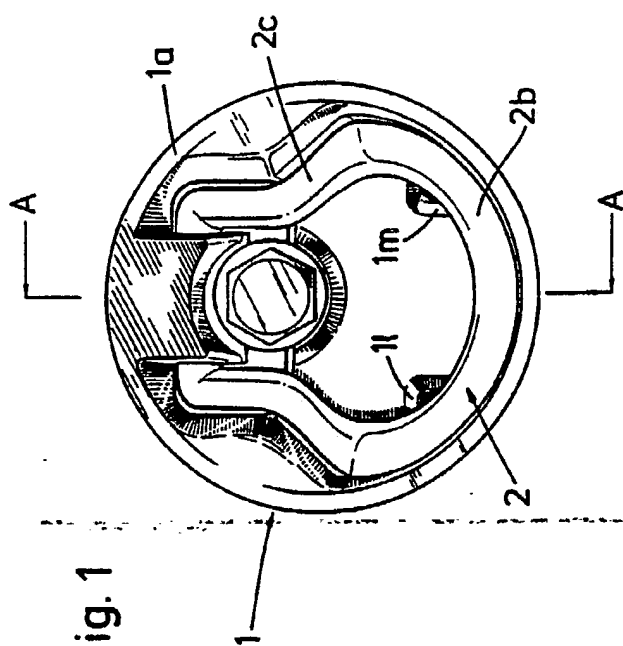


Fig. 1

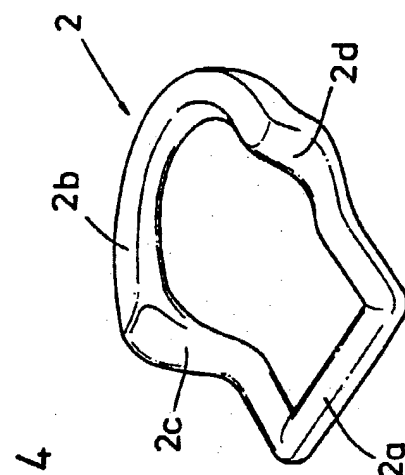


Fig. 4

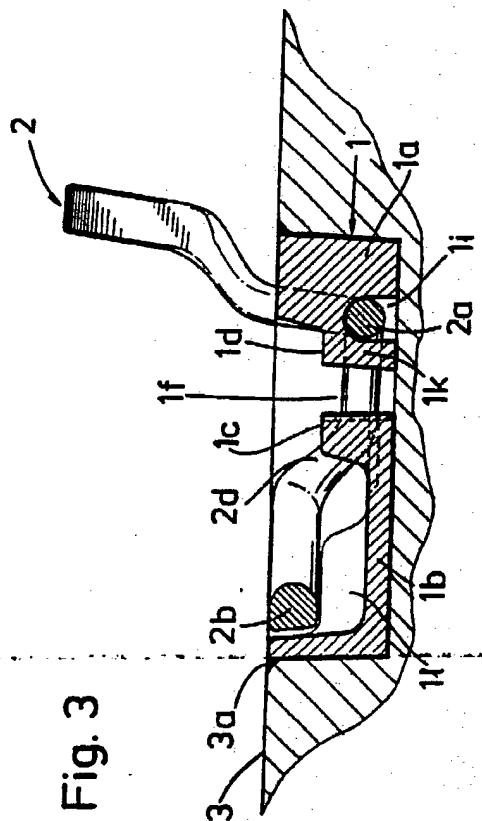


Fig. 3

Fig. 5

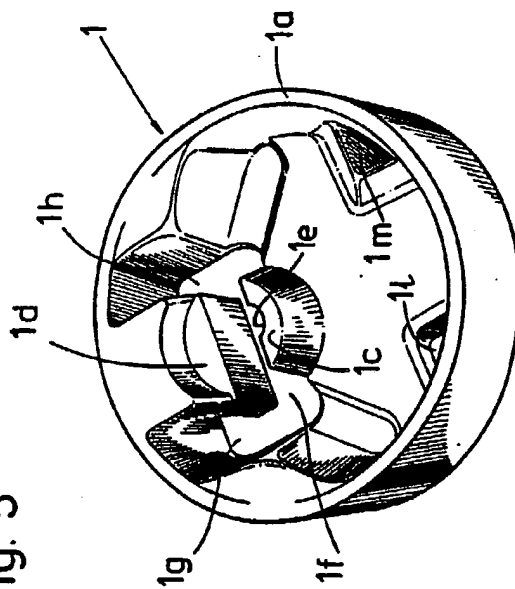


Fig. 6

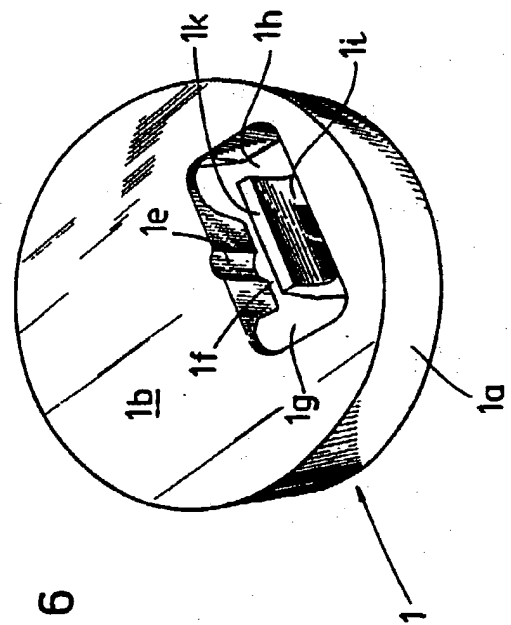
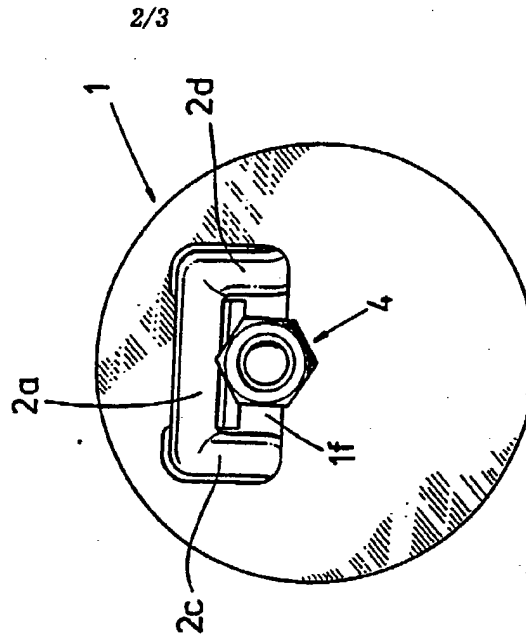


Fig. 7



3/3

Fig. 8

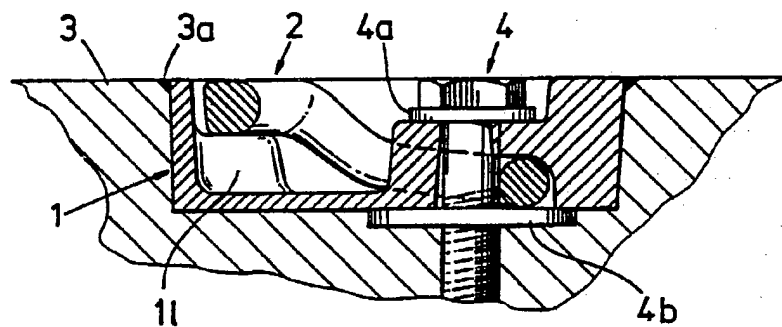
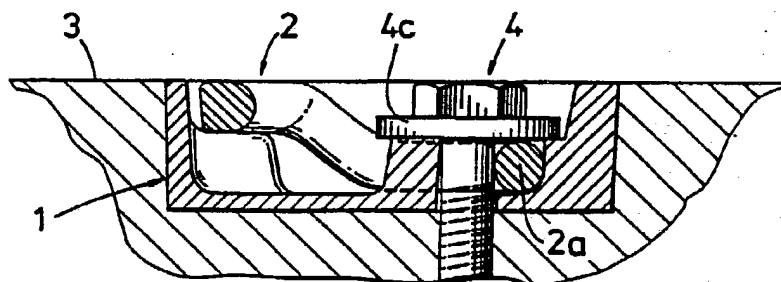





Fig. 9



# INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 90/00636

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) <sup>6</sup> According to International Patent Classification (IPC) or to both National Classification and IPC <b>IPC5: B 60 P 7/08</b>											
<b>II. FIELDS SEARCHED</b> <div style="text-align: center; margin-top: 5px;">Minimum Documentation Searched<sup>7</sup></div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;">Classification System</th> <th style="width: 70%;">Classification Symbols</th> </tr> <tr> <td style="height: 40px; vertical-align: bottom;">IPC5</td> <td style="vertical-align: bottom;">B 60 P</td> </tr> </table> <div style="text-align: center; margin-top: 5px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched<sup>8</sup></div> <p style="margin-top: 10px;">SE,DK,FI,NO classes as above</p>			Classification System	Classification Symbols	IPC5	B 60 P					
Classification System	Classification Symbols										
IPC5	B 60 P										
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Category *</th> <th style="width: 60%;">Citation of Document,<sup>11</sup> with indication, where appropriate, of the relevant passages<sup>12</sup></th> <th style="width: 30%;">Relevant to Claim No.<sup>13</sup></th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td style="vertical-align: top;">DE, C2, 3435714 (RUD-KETTENFABRIK RIEGER &amp; DIETZ GMBH U. CO.) 6 November 1986, see figure 2 <div style="text-align: center;">--</div></td> <td style="text-align: center; vertical-align: top;">1,5</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td style="vertical-align: top;">DE, A, 2016564 (THE BLOXWICH LOCK AND STAMPING COMPANY LTD.) 15 October 1970, see figures 1,(10) <div style="text-align: center;">-- -----</div></td> <td style="text-align: center; vertical-align: top;">1,5</td> </tr> </tbody> </table>			Category *	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>	Y	DE, C2, 3435714 (RUD-KETTENFABRIK RIEGER & DIETZ GMBH U. CO.) 6 November 1986, see figure 2 <div style="text-align: center;">--</div>	1,5	Y	DE, A, 2016564 (THE BLOXWICH LOCK AND STAMPING COMPANY LTD.) 15 October 1970, see figures 1,(10) <div style="text-align: center;">-- -----</div>	1,5
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<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>* Special categories of cited documents:<sup>10</sup></b></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&amp;" document member of the same patent family</p> </div> </div>											
<b>IV. CERTIFICATION</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">           Date of the Actual Completion of the International Search   <b>2nd January 1991</b> </td> <td style="width: 50%; padding: 5px;">           Date of Mailing of this International Search Report   <b>1991 -01- 03</b> </td> </tr> <tr> <td style="width: 50%; padding: 5px;">           International Searching Authority   <div style="text-align: center;"><b>SWEDISH PATENT OFFICE</b></div> </td> <td style="width: 50%; padding: 5px;">           Signature of Authorized Officer  <div style="text-align: center;">   <b>Ulrika Drangel</b> </div> </td> </tr> </table>			Date of the Actual Completion of the International Search  <b>2nd January 1991</b>	Date of Mailing of this International Search Report  <b>1991 -01- 03</b>	International Searching Authority  <div style="text-align: center;"><b>SWEDISH PATENT OFFICE</b></div>	Signature of Authorized Officer <div style="text-align: center;">   <b>Ulrika Drangel</b> </div>					
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ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.PCT/SE 90/00636.

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The members are as contained in the Swedish Patent Office EDP file on 90-11-28  
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-C2- 3435714	86-11-06	EP-A- 0179733	86-04-30
DE-A- 2016564	70-10-15	GB-A- 1238247	71-07-07
		NL-A- 7005213	70-10-13